

MEDICAL ASSEMBLY WITH TRANSDUCER FOR LOCAL DELIVERY OF A
THERAPEUTIC SUBSTANCE AND METHOD OF USING SAME

Jeffrey A. Steward, Brandon S. Gosiengfiao

ABSTRACT

A medical assembly is used to deliver a therapeutic substance to a treatment area. The medical assembly comprises a catheter having a distal end and a proximal end, a transducer supported by at least a portion of the distal end of the catheter assembly, and a delivery lumen mounted on the catheter for delivery of a therapeutic substance. Support for the transducer is provided at a preselected number of anchoring points, wherein an inner surface of the transducer is positioned at a preselected distance from an outer surface of the catheter. The preselected distance defines a gap that is occupied by a low density material such as a gas which reflects acoustic pressure waves directed toward the gap by a transducer when a voltage is applied to the transducer. The reflected pressure wave increases the energy in the system, enhancing transport of therapeutic substances from the delivery lumen to the surrounding tissues and/or cells to be treated. The medical assembly may optionally be used in conjunction with both macroporous and microporous balloons. The medical assembly may optionally be modified so that a plurality of transducers are used, wherein the distal end of a transducer is positioned at a preselected distance from the proximal end of an adjacent transducer.